This is the electronic version of the Annual Fire Weather Report. It contains the essential information as required by National Weather Service Directive 10-404. (*scott weishaar*)

Table one shows the lightning frequency, by area, for the 2016 season.

TABLE 1 - 2016 LIGHTNING DATA (MAY THROUGH OCTOBER)

AREA	# LIGHTNING DAYS 2016	AVE. # DAYS (LAST 21 YEARS)	PERCENT AVE.
ZONES 601/612	7	6.24	112.2%
ZONES 602/603	7	7.67	91.3%
ZONE 604	8	8.48**	94.3%
ZONES 605/607/660	9	12.24	73.5%
ZONES 606/608	8	13.62	58.7%

***** Average over 23-year period.***

DATA OBTAINED FROM BLM LIGHTNING DETECTION AND NORTHWEST COORDINATION CENTER

Examination of the above lightning table shows a general pattern of below-normal lightning frequency for the Portland Fire Weather area. Note that the Cascade zones had well below-normal lightning activity. In fact, during the primary fire season July 15-September 15, there were only 2 lightning days for zones 605/607/660. The Lane County Cascades and foothills, zones 606/608, had NO lightning days. The August 2016 mean temperature anomaly was generally 2-4 degrees above normal for inland areas, with a maximum temperature anomaly of 3-6 degrees above normal. Energy Release Component (ERC) values for Cascade and foothill sites were at or above 97th percentile values during August. The lack of August lightning activity prevented a wildfire outbreak for the forecast area.

GOVERNMENT CAMP SNOW DEPTH: The 2015-16 North Oregon Cascade snowfall had a good start, but eventually turned into another below-normal snowpack season. By early January 2016 Government Camp snow depth was at 60 inches, well above normal. However, by mid-January 2016 the snow depth fell to an average value of around 40 inches, followed by a steady decline to below-average depths. In early March 2016 the measured snow depth was around 12 inches, well below the 50-inch average. Typically, Cascade snowpack peaks in March. Measured snow depth diminished to zero on April 1, 2016. A couple early-April storms resulted in a couple inches of snowfall, but well below the 25-30 inch snow depth average. The last day of measurable snow depth was three inches on April 15th. Snow cover normally persists

through at least the end of May. The largest single-day jump was 22 inches on December 13th. The first day of measurable snow depth occurred November 12th.

GOVERNMENT CAMP PRECIPITATION: For the months November and December 2015 total precipitation was close to normal. Many areas experienced a record-setting December. Government Camp recorded 18.50 inches, or 4.12 inches above normal. This is 128.7% of normal. The Portland airport observed 15.24 inches, or 266.9% of normal. Typical Oregon Coast Range December precipitation anomalies were on the order of 150-250% of normal.

Government Camp received below-normal monthly precipitation in every month from January 2016 through May 2016, except March. April 2016 was abnormally warm and dry. The mean April temperature was 3-7 degrees above normal across the forecast area, with a maximum temperature anomaly of 5-10 degrees above average. The overall precipitation total from November 1, 2015 through May 31, 2016 was 4.04 inches below normal, or 94.3% of average.

RED FLAG WARNING STATISTICS FOR 2016

Table two shows the Red Flag verification statistics for the 2016 fire season.

TABLE 2 (ALL WARNINGS)

ZONE	# RFW	CORRECT RFW (A)	INCORRECT RFW (B)	MISSED EVENTS (C)	POD A/(A+C)	CSI A/(A+B+C)	FAR (1-[A/(A+B)])
OR601	1	0	1	1	0.000	0.000	1.000
WA601	1	0	1	1	0.000	0.000	1.000
612	1	0	1	1	0.000	0.000	1.000
OR602	2	2	0	0	1.000	1.000	0.000
WA602	2	2	0	0	1.000	1.000	0.000
603	3	2	1	0	1.000	0.667	0.333
OR604	4	3	1	0	1.000	0.750	0.250
WA604	2	2	0	0	1.000	1.000	0.000
605	3	3	0	0	1.000	1.000	0.000
606	3	2	1	0	1.000	0.667	0.333
607	2	2	0	0	1.000	1.000	0.000
608	3	2	1	0	1.000	0.667	0.333
660	2	2	0	0	1.000	1.000	0.000
TOTALS (ALL)	29	22	7	3	0.880	0.688	0.241
LIGHTNING	0	0	0	0	0.000	0.000	0.000
WIND/RH	19	12	7	0	1.000	0.632	0.368
HAINES 6	10	10	0	3	1.000	0.769	0.000

NUMBER OF WARNED EVENTS: 3 (EXCEPT 4 OR604)

EVENTS PRECEEDED BY A WATCH: 1
MISSED EVENTS: 1

NOTE: Refer to the Annual Operating Plan for complete Red Flag criteria.

WARNING NOTES – A multi-day episode occurred August 18-20th. The initial cause was wind and low humidity. However, by the 20th, more emphasis was given to dry and unstable conditions. This episode was counted as two separate events. Fire zones 601, 602, and 604 cross state-boundaries. The Oregon and Washington portions were tabulated separately. North wind and low humidity patterns can develop in the Central and South Willamette Valley, but do typically not meet criteria in the North Willamette Valley or the Washington portion of zone 604.

EVENT LEAD TIMES

Tables 3 and 4 show the respective warning and watch lead times for all events in 2016.

TABLE 3 – WARNING LEAD TIMES

EVENT	*RANGE OF LEAD TIMES*	*AVE. ZONE LEAD TIME*
August 16-20 (Wind/RH)	**50 hrs 19 min OR ZONE 604** **36 hrs 29 min WA ZONE 604** **39 hrs 32 min OR ZONE 602** **39 hrs 32 min WA ZONE 602** **ZONE 603 DID NOT VERIFY** **37 hrs 26 min ZONE 605** **37 hrs 26 min ZONE 607** **37 hrs 26 min ZONE 660**	**39 HRS 44 MINS**
August 16-20 (Dry/Unstable)	**53 hrs 20 min OR ZONE 602** **53 hrs 20 min WA ZONE 602** **54 hrs 20 min ZONE3 603** **9 hrs 36 min OR ZONE 604** **57 hrs 20 min WA ZONE 604** **66 hrs 20 min ZONE 605** **66 hrs 20 min ZONE 606** **68 hrs 20 min ZONE 607** **67 hrs 20 min ZONE 608** **68 hrs 20 min ZONE 660**	**56 HRS 28 MINS**
September 12 (Wind/RH)	**7 hrs 1 min ZONE 603** **4 hrs 56 min OR ZONE 604** **6 hrs 14 min ZONE 605** **6 hrs 54 min ZONE 606** **6 hrs 54 min ZONE 608**	**6 HRS 24 MINS**
OVERALL AVE. LEAD TIME		**39 HRS 45 MINS**

TABLE 4 – WATCH LEAD TIMES

EVENT	*RANGE OF LEAD TIMES*	*AVE. ZONE LEAD TIME*
August 16-20 (Wind/RH)	**68 hrs 49 min OR ZONE 604** **61 hrs 5 min WA ZONE 604** **64 hrs 8 min OR ZONE 602** **64 hrs 8 min WA ZONE 602** **62 hrs 2 min ZONE 605** **62 hrs 2 min ZONE 607** **62 hrs 2 min ZONE 660**	**63 HRS 28 MIN**
August 16-20 (Dry/Unstable)	**NO WATCH ISSUED**	**Not Applicable**
September 12 (Wind/RH)	**NO WATCH ISSUED**	**Not Applicable**
OVERALL AVE. LEAD TIME		**63 HRS 28 MINS**

August 16-20 Event: A Watch was issued August 16th at 1404 PDT for all zones except 601, 602 and 612 for wind and low humidity. Oregon zone 604 had two watches in effect for this multi-day event: 1) Watch valid the afternoon of August 18th through the evening and 2) Watch valid early morning of the 19th through the early morning of the 20th. The first wind/RH portion did not verify. Dry and unstable criteria were added to the warning at 1440 PDT August 17th. This was counted as a separate event, without a watch issuance. Critical fuel conditions existed in zones 601 and 612 and RH criteria (25% or less) was met at more than one station. Thus, the dry and unstable portion of this episode was counted as a missed event for those two zones.

NFDRS VERIFICATION

The Portland office switched to all-points NFDRS forecast in 2009, instead of zone trend forecasts. It was shown by neighboring forecast offices that individual point forecasts yielded higher verification scores versus zone trend forecasts. Prior to 2009, the Portland office provided individual NFDRS forecasts for eight sites: Village Creek, Pebble, Fields, South Fork, Wanderer's Peak, Horse Creek, Yellowstone, and Canyon Creek. Table five (below) shows the 2016 NFDRS verification statistics for the above listed sites. The values in red indicate improvement over the 2015 scores.

NFDRS will undergo a significant change for the 2017 fire season. The entire program and many algorithms will be changed. One of the most significant changes will be the number of fuel models used in NFDRS.

TABLE 5 – 2016 SITE-SPECIFIC NFDRS VERIFICATION

SITE	TEMPERATURE			HUMIDITY			WIND		
	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE	FCST MAE	PERS. MAE	SCORE
Village Creek	*3.42*	*6.36*	*46.23%*	*9.09*	*14.13*	*35.67%*	*1.14*	*1.23*	*7.32%*
Pebble	*3.56*	*7.02*	*49.29%*	*9.65*	*16.54*	*41.66%*	*1.27*	*1.32*	*3.79%*
Fields	*3.50*	*6.80*	*48.53%*	*10.48*	*15.88*	*34.01%*	*1.68*	*1.93*	*12.95%*
South Fork	*3.42*	*6.08*	*43.75%*	*10.64*	*16.34*	*34.88%*	*1.03*	*1.10*	*6.36%*
Wanderer's Peak	*3.47*	*6.73*	*48.44%*	*8.74*	*14.84*	*41.11%*	*1.31*	*1.68*	*22.02%*
Horse Creek	*3.25*	*6.55*	*50.38%*	*9.20*	*14.07*	*34.61%*	*0.74*	*0.78*	*5.13%*
Yellowstone	*3.57*	*6.91*	*48.34%*	*9.76*	*15.28*	*36.13%*	*1.65*	*1.76*	*6.25%*
Canyon Creek	*4.36*	*8.04*	*45.77%*	*10.41*	*17.45*	*40.34%*	*1.01*	*1.18*	*14.41%*

Table six shows the 2016 NFDRS verification statistics, by zone followed by the overall scores. Improvement in temperature, RH and wind are shown in blue. Red values indicate lower scores.

TABLE 6 – 2016 NFDRS VERIFICATION

ZONE	TEMPERATURE	HUMIDITY	WIND
601	38.59%	29.49%	12.12%
602	44.26%	36.94%	16.02%
603	40.33%	32.77%	10.64%
604	43.70%	28.34%	17.98%
605	51.61%	37.59%	12.95%
606	47.18%	32.25%	10.53%
607	48.45%	41.56%	10.16%
608	47.67%	39.69%	7.55%
612	31.87%	29.10%	12.68%
660	46.24%	38.56%	18.27%
ALL	44.29%	35.33%	14.06%
2015 ALL	37.95%	31.42%	7.37%
2014 ALL	39.43%	34.64%	10.66%
2013 ALL	32.92%	31.07%	1.00%

2012 ALL	**36.2%**	**30.2%**	**-2.2%**
2011 ALL	**37.4%**	**32.2%**	**7.5%**
2010 ALL	**38.5%**	**28.1%**	**5.5%**
2009 ALL	**40.5%**	**33.7%**	**4.0%**

FORECASTS AND SERVICES

SPOT FORECASTS

Spot forecast requests in 2016 were slightly higher compared to last year. There were 192 spot requests through early December 2016, compared to 171 last year. The number of wildfire spots was much lower than average. There were only 35 wildfire spot requests, the lowest number since 2013. There were 115 prescribed burn spot requests. The earliest prescribed burn spot request was the Finley Piles project from the Fish and Wildlife Service (USFWS) on January 11th. The latest was also from the USFWS, the PFW Helt Pile burn on November 4th. The earliest wildfire spot request was May 1st, from the Pacific Cascade Unit of the Washington Department of Natural Resources (DNR), for the Yale View Fire. The latest wildfire request occurred August 30th for the High Pass 12.5 Fire, from the Western Lane unit of the Oregon Department of Forestry (ODF).

The majority of prescribed fire spot requests occurred in September and October. There were a total of 66 requests for the two month period. Surprisingly, there were 13 prescribed burn spot requests in the January-February time frame. Nearly 80% of the wildfire spot requests occurred in August. There were five requests in July and two in May. The 2016 fire season was one of the few that did not have any wildfire spot requests in September or October.

The use of spot forecasts continues to become more diverse. There were a number of requests (almost 22%) for search-and-rescue missions, training exercises by local fire departments, public safety, spray projects and buoy deployments. There were five spot requests for annual early-spring spray activities. Figure 1 (below) shows the 2016 spot breakdown by month.

The Willamette National Forest has always been one of the primary users of the spot forecast program. However, the USFWS has become more active in using the spot program for prescribed burn projects. The Willamette NF accounted for 44 of the 67 Forest Service spot forecast requests. The Gifford Pinchot National Forest remained a primary participant, with 20 spot requests, but most of those were non-fire related. The USFWS accounted for 63 prescribed burn spot requests. The US Forest Service accounted for about 33 percent of all spot requests. Typically, the Forest Service provides for nearly 50 percent of all spot requests. Other agencies that were prominent in the spot forecast program included the ODF, BLM, the Nature Conservancy, local fire departments, and county sheriff departments. Mountain Rescue Units are becoming more familiar with the spot forecast program, accounting for eight requests in 2016.

The most active spot months were August, September and October. Wildfire spot requests dominated August, while most September and October requests were for prescribed burn projects. Wildfire requests typically start to increase in July and reach a peak in August. The

2016 prime fire season was relatively short, starting in late July and ending by the end of August. Lightning frequency during the peak fire season was well below normal. There were 16 wildfire spots on federal land, and 19 on state-protected areas.

Figure 1 - 2016 SPOT FORECASTS (BY MONTH)

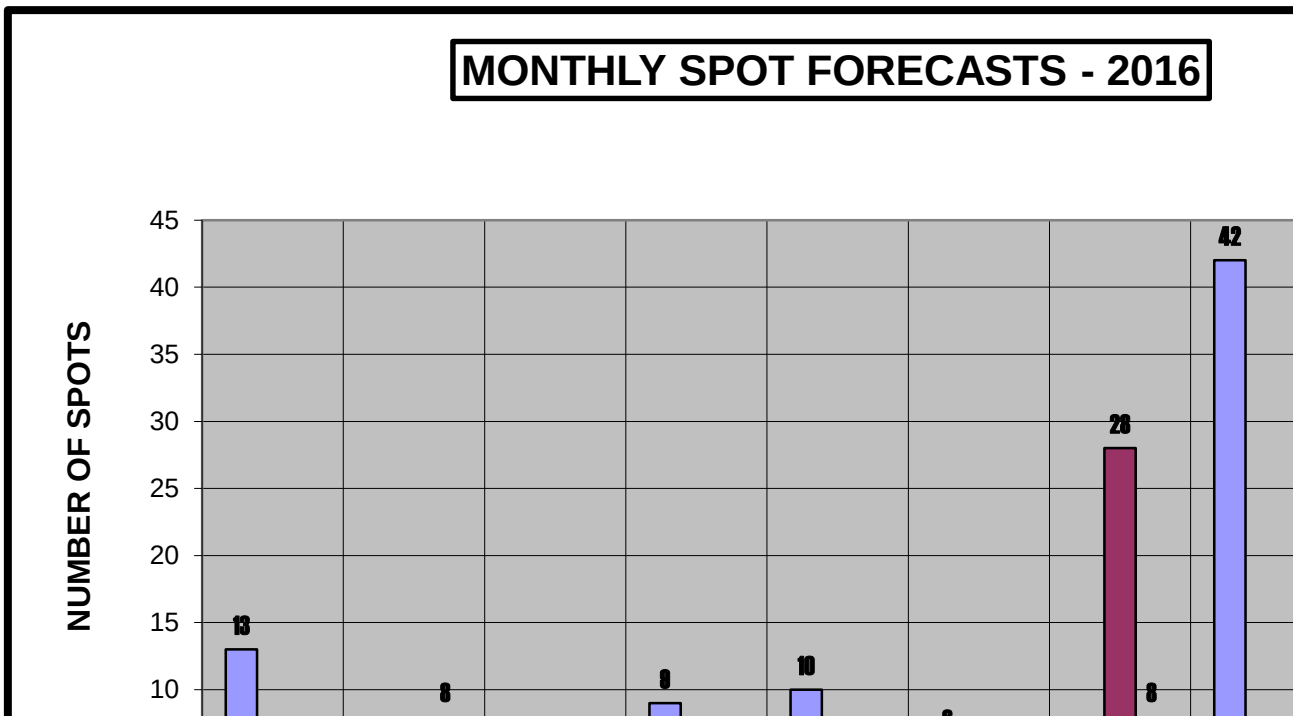


Table 7 (below) shows the annual spot forecast data from 1995 to 2016. Spot frequency showed a dramatic increase from 2000 to 2003, but due to the change in forecast area responsibility and agency requirements for prescribed burns, 2004 spot totals were much lower. Also, some units/districts curtailed prescribed burn activities starting in 2004 due to budget constraints, staffing concerns, or a number of other reasons. The number of prescribed burn spot requests in 2016 was much higher than last year.

Seasonal spot totals exhibited a consistent trend from 2008 to 2010, with an average of about 125 spots per season. The 2011 spot season was the busiest since the 2003 transfer of fire weather zones 609, 610, and 611 to the Pendleton office. The 2013 spot tally was a little unusual due to the low number of wildfire spots, but 2014 more than made up for the previous year's low number. The 2016 spot forecast distribution showed one primary peak period, from August through September. There were 119 spot requests during the 3-month period. The 2016 fire season was somewhat unusual due to the lack of fire activity in September and October. Prescribed burning activity increased in September due to favorable conditions and lower fuel indices. October was extremely wet, with record-setting rainfall in many areas. There were 157 non-wildfire spot requests in 2016, the most since at least 1995.

TABLE 7 – ANNUAL SPOT FORECAST DATA

YEAR	PROJECT*	WILDFIRE	TOTAL
1995	104	15	119
1996	64	51	115
1997	58	9	67
1998	52	31	83
1999	58	54	112
2000	89	20	109
2001	125	70	195
2002	123	147	270
2003	117	132	249
2004	71	21	92
2005	55	29	84
2006	120	96	216
2007	70	25	95
2008	61	73	134
2009	57	58	115
2010	69	51	120
2011	128	93	221
2012	106	51	157
2013	128	25	153
2014	103	96	199
2015	87	84	171
2016	157	35	192

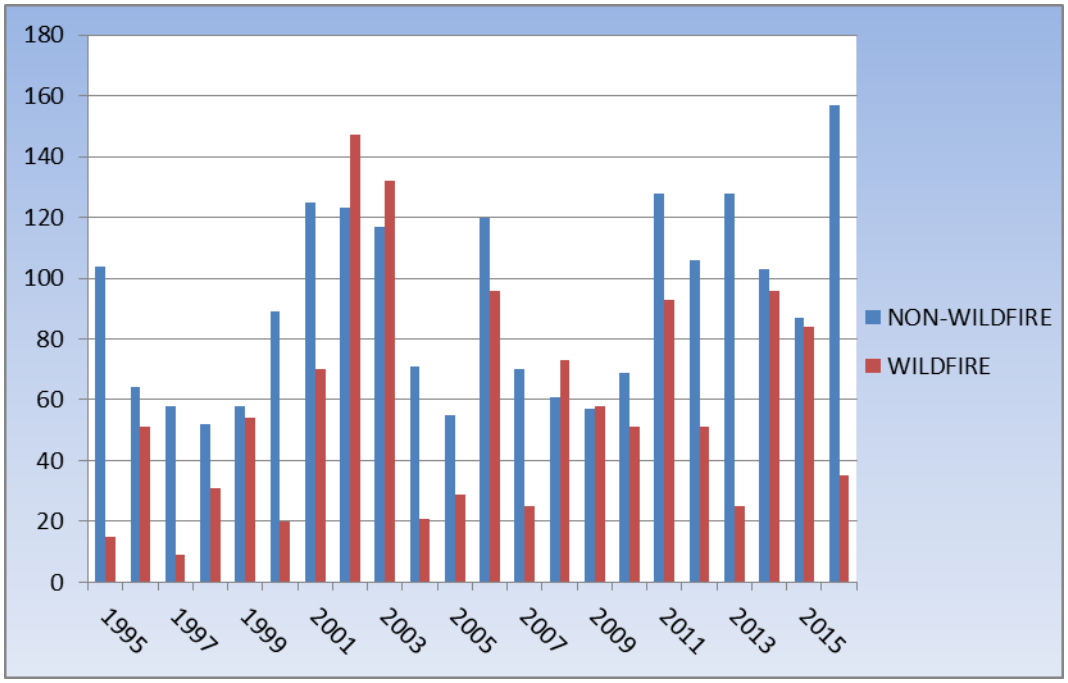
**** = INCLUDES TRAINING SPOTS, SEARCH AND RESCUE, AND OTHER MISC. REQUESTS.***

First prescribed spot request:	***Jan 11, 2016***	***Finley Piles***	***USFWS***
Last prescribed spot request:	***Nov 4, 2016***	***PFW Helt Piles***	***USFWS***
First wildfire spot request:	***May 1, 2016***	***Yale View Fire***	***DNR Pac Cascade***
Last wildfire spot request:	***Aug 30, 2016***	***High Pass 12.5 Fire***	***ODF West Lane***

OTHER 2016 SPOT TIDBITS

- The Mt. Hood NF had just 2 spot requests, both for wildfire.
- The Nature Conservancy submitted 9 spot requests.
- There were 12 Search and Rescue spot requests.
- The new web-based spot page was implemented in mid-October.
- Of the 5 spray-project requests, 4 were from Salem BLM for the Tyrell Spray.
- The most spot requests in one day was 10, on September 29.
- There were just 5 wildfire spot requests in July.
- 16 of the 28 wildfire spots in August were for the 2500 Road Fire and the High Pass 12.5 Fire, both on ODF land.
- Nearly all of the spot requests from the Gifford Pinchot NF were for the Spirit Lake Tunnel repair project.

Figure 2 – Annual Spot Forecast Totals



TURN-AROUND TIME

Turn-around times (see chart below) have been fairly consistent over the past several years. Wildfire spot request turn-around time was a few minutes longer in 2016 compared to 2015. Prescribed burn request turn-around time was about the same as 2015, but remained under 40 minutes. Turn-around time was not counted for next-day spots. Average turn-around time for all other non-wildfire or non-prescribed burn spots was 38 minutes, about 9 minutes faster than 2015.

FIGURE 3 - ANNUAL SPOT FORECAST TURN-AROUND TIME

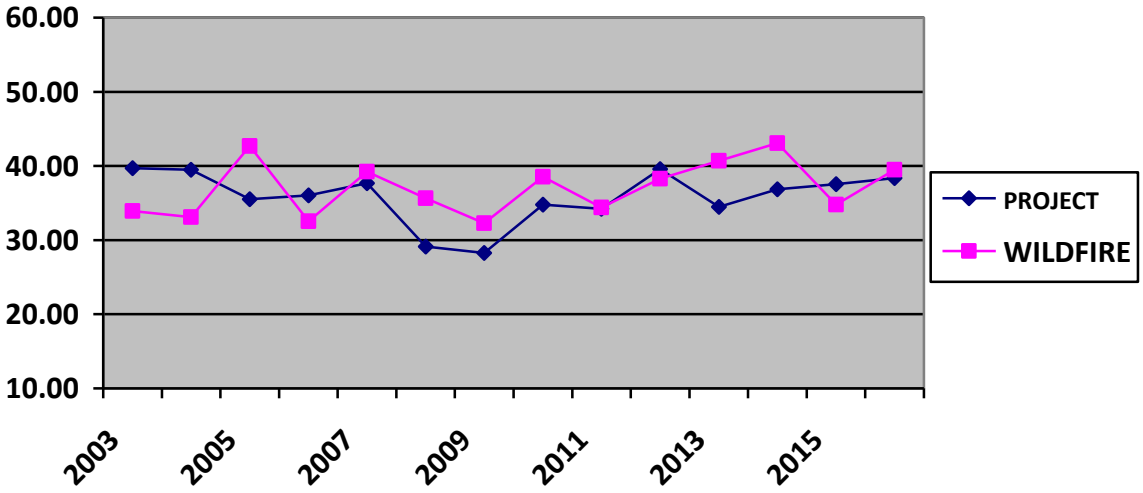


TABLE 8 – TURN-AROUND TIMES

YEAR	PROJECT	WILDFIRE
2016	**38:23**	**39:30**
2015	**37:32**	**34:48**
2014	**36:52**	**43:05**
2013	**34:30**	**40:43**
2012	**39:35**	**38:17**
2011	**34:13**	**34:24**
2010	**34:47**	**38:33**
2009	**28:17**	**32:16**
2008	**29:07**	**35:38**
2007	**37:41**	**39:14**
2006	**36:01**	**32:33**
2005	**35:30**	**42:42**
2004	**39:30**	**33:06**
2003	**39:42**	**33:54**

- ***PROJECT TIMES ONLY INCLUDE PRESCRIBED BURN SPOTS***

One of the larger 2016 wildfires was the High Pass Road Fire, about 10 miles west of Junction City on private and BLM land protected by the ODF. The fire was detected on August 25th and grew to almost 200 acres. The fire was contained on August 30th. ODF IMT team 2 assumed command of the fire on the 26th. An Incident Meteorologist (IMET) from the Medford Forecast Office was ordered for the incident, but the order was cancelled.

Another ODF fire, the 2500 Road Fire, started on the evening of August 22nd, near Depoe Bay. As of the morning of August 25th, there were 365 personnel on the fire. The fire consumed around 200 acres. It is somewhat unusual to get large fires in the north and central coastal areas. This fire was aided by on offshore flow pattern.

Incident 068, which was renamed the Blue Top Incident, was discovered around 3 pm on July 27th. The fire started near the Blue Pool and Tamolitch Falls, on the McKenzie River Trail. The fire grew to 15 acres by the end of July, but a localized erratic wind pattern on August 1st pushed the fire to 21 acres. A Type 3 IMT assumed command on July 31st. By September 8th the fire was at 58 acres. A section of the popular McKenzie River Trail was closed for several weeks. The entire trail was finally accessible on September 8th.

LARGE FIRES AND IMET DISPATCHES

The 2016 fire season had the potential to be more severe than past years due to an abnormally warm and dry April and May and an extended summer hot spell in August. General fuel conditions were well above seasonal normal values in May, but were tempered in June and early July by periodic wetting rain events. There was a much lower frequency of lightning in August compared to previous years, which limited wildfire activity. There were no August lightning days in 2016. There was just one fire that necessitated a Type 2 IMT team. A couple other fires required a Type 3 IMT. Table 9 shows the largest fires of the 2016 fire season.

TABLE 9 – MAJOR FIRES

FIRE NAME	AGENCY	SIZE	START DATE	CONTAIN DATE	CAUSE
High Pass 12.5 Fire	ODF – Western Lane	191	August 25, 2016	August 30, 2016	Unknown
2500 Road Fire	ODF – Western Oregon North	~200	August 22, 2016	August 27, 2016	Under Investigation
Blue Top Incident	USFS Willamette NF	58	July 27, 2016	September 30, 2016	Under Investigation

The Portland office filled **FIVE IMET** requests.

1. PONY FIRE (13 DAYS)

IMET: SHAWN WEAGLE
DATES: June 9th through June 22nd, 2016
LOCATION: ICP – Happy Camp, CA
Incident – Klamath NF(Happy Camp/Oak Knoll RD)
IMT: NorCal Team 2 – IC Young
CAUSE: Lightning

2. RAIL FIRE (16 DAYS)

IMET: JON BONK
DATES: August 2nd through August 18th, 2016
LOCATION: ICP – Unity, OR
Incident – Wallowa Whitman NF
IMT: Northwest Team 12 Aug 3-15 – IC Harrod
Northwest Team 6 Aug 15-18 – IC Sheldon
CAUSE: Under Investigation

3. CHIMNEY FIRE (11 DAYS)

IMET: SCOTT WEISHAAR
DATES: August 22nd through September 2nd, 2016

LOCATION: ICP – Paso Robles, CA
Incident – CAL Fire – San Luis Obispo Unit
IMT: CAL Fire Team 2 – IC Patterson
CAUSE: Under Investigation

4. SOBERANES FIRE – HUNTER LIGGETT SPIKE (15 DAYS)

IMET: JON BONK
DATES: September 11th through September 25th, 2016
LOCATION: ICP – Fort Hunter Liggett, CA
Incident – USFS Los Padres NF
IMT: Alaska IMT Type 1 – IC Kurth September 13, 2016
California IMT Team 4 – IC Opliger September 14-25
CAUSE: Illegal Campfire

5. SOBERANES FIRE – (13 DAYS)

IMET: SHAWN WEAGLE
DATES: October 1st through October 13th, 2016
LOCATION: ICP – Rana ICP 10 SE Carmel Valley, CA
Incident – USFS Los Padres NF
IMT: Central Coast Type 2 – IC Van Arroyo (Oct 1-12)
Central Sierra Type 2 – IC Mills (Oct 13)
CAUSE: Illegal Campfire

TABLE 10 – TRAINING AND EDUCATIONAL OUTREACH ACTIVITIES

DATES	ACTIVITY	AGENCY/USER	INSTRUCTOR
January 26, 2016	S-390 BEND	CENTRAL OR COMM. COLLEGE	WEISHAAR
March 14-18, 2016	IMET CEE	BOISE, ID	WEISHAAR ON CADRE WEAGLE ATTENDING
March 29, 2016	PAC NW IMT WORKSHOP	VARIOUS	WEISHAAR/WEAGLE
March 31, 2016	FIRE WX REFRESHER	HJ ANDREWS EXP. FOREST	WEISHAAR
April 20-21, 2016	NWS/NWCC MEETING	NWS/NWCC	WEISHAAR
April 25, 2016	RT-130 TROUT LAKE	MT. ADAMS RD	BONK
May 16, 2016	RT-130 PACK TEST	COL. GORGE NSA	WEISHAAR ATTENDEE
May 26, 2016	FIRE WX TALK	GLADSTONE ROTARY	BONK
June 7, 2016	FIRE WX REFRESHER	COL. GORGE NSA	WEISHAAR
June 8-9, 2016	S-290	ESTACADA RD	BONK
June 13, 2016	S-190 CAMP BALDWIN	MT. HOOD NF	NEUMAN
June 21-22, 2016	S-290 SWEET HOME	ODF	BONK
September 29, 2016	S-190 PCC CASCADE	PORTLAND COMM. COLLEGE	BONK